

CLAIMS

1. A method of eliciting a Raman signal from a living cell, or a plurality of living cells, said method comprising irradiating the cell with a laser having a wavelength of  $785 \pm 60$  nm.
2. A method according to claim 1 comprising irradiating the cell with a laser having a wavelength of  $785 \pm 20$  nm.
3. A method according to claim 1 or claim 2 wherein the cell is exposed to a total energy of at least about 20 Joules.
4. A method according to any preceding claim wherein the cell is exposed to a total energy of at least about 100 Joules.
5. A method according to any preceding claim wherein the cell is exposed to a total energy of at least about 200 Joules.
6. A method according to any preceding claim wherein the cell is exposed to a total energy of at least 275 Joules.
7. A method according to any preceding claim wherein the cell is irradiated at an intensity of  $115 \pm 50$  mW.
8. A method according to any one of claims 1 to 6 wherein the cell is irradiated at an intensity of  $120 \pm 60$  mW.
9. A method according to any preceding claim wherein the cell is irradiated for a period of up to 40 minutes.
10. A method according to any preceding claim wherein the laser is focussed within the cytoplasm of the cell.

11. A method according to any one of claims 1 to 9 wherein the laser is focussed within the nucleus of the cell.
12. A method according to any one of claims 1 to 9 wherein the laser is focussed within the extracellular matrix.
13. A method according to any preceding claim wherein the cell is cultured on a bioinert material.
14. A method according to claim 13 wherein the bioinert material is poly-L-lysine coated fused silica.
15. A method according to any preceding claim wherein the cell is cultured on a bioactive scaffold.
16. A method according to any one of claims 1 to 12 wherein the cell is cultured on an uncoated bioactive glass or a sol-gel derived gel glass.
17. A method of detecting changes in a living cell or a plurality of living cells, said method comprising the steps of:
  - (i) eliciting a Raman signal in accordance with any one of claims 1 to 16; and
  - (ii) measuring changes in the Raman signal over a period of time.
18. A method according to claim 17 for detecting changes in the cell phenotype.
19. A method according to claim 17 for monitoring cell growth.
20. A method according to claim 17 for detecting changes in a living cell induced by a pharmaceutical agent or a cytotoxic agent.

21. A method according to any one of claims 17 to 20 for detecting changes in protein levels.
22. A method according to any one of claims 17 to 20 for detecting changes in DNA or RNA levels.
23. A method according to any one of claims 17 to 20 for detecting changes in the extracellular matrix.
24. A method according to any preceding claim for detecting the cell cycle of a living cell.
25. A method according to any preceding claim for detecting changes in the cell cycle of a living cell.
26. A method according to any preceding claim for detecting the onset of cell death by apoptosis.
27. A method according to any preceding claim for detecting the onset of cell death by necrosis.
28. Use of a laser having a wavelength of  $785 \pm 60$  nm to elicit a Raman signal in a living cell or a plurality of living cells.
29. Use according to claim 28 wherein the laser has a wavelength of  $785 \pm 20$  nm.